Amendments to the Claims – Current Status of Claims

1. (Currently Amended) A method of fabricating a **cathode** using electrophoretic deposition comprising the steps of:

providing a substrate;

providing a solvent, having a solute comprised of dissolved **metal ions** disposed therein, the solvent and solute forming a binder solution;

immersing the substrate into the binder solution;

applying a voltage to the immersed substrate thereby providing **for** ~~the adhesion~~ electrophoretic deposition of ~~the binder solution~~ a product **formed in situ** to the immersed substrate and thereby forming a layer of binder **material on the** immersed substrate;

removing the substrate having the layer of binder material **formed thereon** from the binder solution;

providing a suspension bath characterized as a colloidal **solution of an** emitting structure;

immersing the substrate having the layer of binder material **formed thereon,** into the suspension bath;

removing the substrate from the suspension bath; and

thermal processing of the substrate to form adhesion properties.

2. (Currently Amended) A method of fabricating a **cathode** using electrophoretic deposition as claimed in claim 1 wherein the step **of providing a**

substrate, includes providing a substrate having a plurality of patterned metal electrodes formed thereon a surface of the substrate.

3. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition as claimed in claim 4 wherein the providing a solvent, having a solute disposed therein, includes the step of providing at least one of an alcohol, a water, or a glycerin solvent, having a solute salt disposed therein.

4. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition as claimed in claim 3 wherein the binder material is magnesium hydroxide ($Mg(OH)_2$).

5. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition as claimed in claim 3 wherein the step of providing a suspension bath characterized as a colloidal solution of an emitting structure includes a colloidal solution of carbon nanotubes suspended in a solvent.

6. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition as claimed in claim 5 wherein the step of providing a suspension bath characterized as a colloidal solution of an emitting structure further includes the step of adding to the colloidal solution, a dispersion agent, to improve suspension properties.

7. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition as claimed in claim 5 wherein the step of immersing the substrate having the binder material formed thereon, into the colloidal solution of an emitting structure further includes the step of applying a bias to the suspension bath, thereby providing for the migration and binding of the emitting structures to the binder material.

8. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition as claimed in claim 1 wherein the step of thermal processing the substrate to form adhesion properties, further includes the formation of a plurality of micro-islands in the binder layer defined by a plurality of edges, the plurality of micro-islands having a plurality of emitting structures embedded in the micro-islands and protruding from the edges.

9. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition comprising the steps of:

providing a substrate having a plurality of metal electrodes formed thereon;

providing a binder solution including a solvent and a solute salt comprised of dissolved metal ions;

immersing the substrate into the binder solution;

electrophoretically depositing a product formed in situ ~~the binder solution~~ on a surface of the immersed substrate, thereby forming a layer of binder material on the plurality of metal electrodes formed thereon the substrate;

providing a carbon nanotube suspension bath;

immersing the substrate having the layer of binder ~~solution~~ material formed thereon, into the carbon nanotube suspension bath;

removing the substrate from the carbon nanotube suspension bath; and

thermal processing of the substrate to form adhesion properties in the binder layer and form micro-islands defined by a plurality of edges, and having carbon nanotubes protruding from the edges of the micro-islands.

10. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition as claimed in claim 9 wherein the step of providing a solvent, having a solute disposed therein, includes the step of providing at least one of an alcohol, a water, or a glycerin solvent, having a solute salt disposed therein.

11. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition as claimed in claim 10 wherein the alcohol is one of methanol, ethanol, or isopropyl alcohol (IPA).

12. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition as claimed in claim 11 wherein the step of electrophoretically depositing the product formed in situ ~~binder solution~~ on a surface of the immersed substrate, thereby forming a layer of binder material includes the step of applying a voltage to the immersed substrate thereby providing for the adhesion of the ~~binder solution~~ product formed in situ to the substrate and forming a layer of binder material on the substrate.

13. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition as claimed in claim 12 wherein the binder material is magnesium hydroxide ($Mg(OH)_2$.

14. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition as claimed in claim 12 wherein the step of providing a carbon nanotube suspension bath includes the step of providing a colloidal solution of carbon nanotubes suspended in an alcohol solvent.

15. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition as claimed in claim 12 wherein the step of providing a carbon nanotube suspension bath characterized as a colloidal solution of an emitting structure further includes the step of adding to the colloidal solution, a dispersion agent, to improve suspension properties.

16. (Currently Amended) A method of fabricating a cathode using electrophoretic deposition as claimed in claim 12 wherein the step of immersing the substrate having the binder material formed thereon, into the colloidal solution of carbon nanotubes further includes the step of applying a bias to the suspension bath, thereby providing for the migration and binding of the carbon nanotubes to the binder material.

Claims 17-20 (canceled)